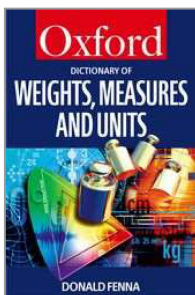


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A Dictionary of Weights, Measures, and Units

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hardness numbers

engineering. The pioneer scale for hardness of solids was the **Mohs** scale of 1824, using ten natural minerals as the comparators. Elaborated in 1933 to the fifteen-point **Ridgeway** or **modified Mohs** scale, it is shown, with values of the Knoop scale, in Table 22. For further values see any edition of *C. R. C. Handbook of Chemistry and Physics* (Cleveland, OH: C. R. C. Press)

Table 22

Mohs	Ridgeway	Material	Knoop
1	1	talc	
2	2	gypsum	32
3	3	calcite	135
4	4	fluorite	163
5	5	apatite	430
		glass	530
6	6	feldspar	560
	7	vitreous pure silica	
7	8	quartz	820
	9	garnet	1 360
8	10	topaz	1 340
9		corundum	1 800
	11	fused zirconia	2 100
	12	fused alumina	
	13	silicon carbide	2 480
	14	boron carbide	2 750

The **Rockwell** scales of 1922 use a ball or a pointed indenter, but with depth of indent being salient. It uses a range of set cones for different sectors of hardness, these being labelled with letters that must be appended to the penetration reading. A load of 1 kg is applied throughout the test, setting the zero datum before the test load is applied.

Select approximate comparisons are shown in Table 23 (with WC = tungsten carbide). See latest *Machinery's Handbook* (New York: Industrial Press, 2000 or later) for more

Table 23

name:	Rockwell				Vickers	Brinell	Shore		
scale:	C	A	D	superficial					
load:		60 kg-f	100 kg-f						
penetrator:						std	WC		
	68	85.6	76.9	93.2	75.4	940			97
	60	81.2	70.7	90.2	66.6	697		654	81
	52	76.8	64.6	86.4	57.4	544	500	512	69
	44	72.5	58.5	82.5	47.8	434	409	409	58
	36	68.4	52.3	78.3	38.4	354	336	336	49
	28	64.3	46.1	73.9	28.9	286	271	271	41

name:		Rockwell		Vickers		Brinell	Shore		
	20	60.5	40.1	69.4	19.6	238	226	226	34
		160	152	152					24